

CLAIMS

WHAT IS CLAIMED IS:

1. An optical element for reflecting and/or redirecting light rays entering therein and again emerging therefrom, said optical element comprising:

a transparent base body which is so structured and/or formed that, with the formation of reflection surfaces bounding the base body, at least a part of the light rays impinging upon the reflection surfaces upon emergence from the transparent base body are totally reflected; and

at least one cover body having cover body surfaces arranged behind the reflection surfaces,

said base body and said at least one cover body being of materials which do not react with each other and,

the reflection surfaces and the corresponding cover body surfaces providing between them a microscopic gap which results from applying, while in the liquid state, one of said base body and said at least one cover body to the other while in the liquid state.

2. An optical element according to claim 1 wherein,

the base body comprises a plate-like base part, one side of which is occupied by microprisms which taper, starting from their roots, with the formation of depressions, whereby the side surfaces of the microprisms form the reflection surfaces and the cover bodies fill the depressions between the microprisms.

3. An optical element according to claim 2 wherein,

said microprisms have upper sides which are covered by a transparent plate which is of the same material as the base body and which is connected to the base body to form one piece.

4. An optical element according to claim 2 wherein,
said one side of the base body is completely covered over by the cover
body.
5. An optical element according to claim 2 wherein,
said body is plate-like.
6. An optical element according to claim 2 wherein,
said body is curved.
7. An optical element according to claim 1 wherein
at least one light emitting diode is arranged within the transparent base
body.
8. An optical element according to claim 1 wherein,
said at least one cover body is reflective.
9. An optical element according to claim 1 wherein,
said at least one cover body applied to said base body by means of casting
or injection molding or injection compressing.
10. An optical element according to claim 1 wherein,
said transparent base body and said at least one cover body are of different
materials.
11. An optical element according to claim 10 wherein,
said base body and said at least one cover body are of materials which do
not connect said bodies but instead define an air gap between them.
12. An optical element according to claim 1 wherein,
the transparent base body and/or said at least one cover body are of plastic.

13. An optical element according to claim 12 wherein,
the transparent base body is of polymethylmethacrylate (PMMA).
14. An optical element according to claim 12 wherein,
said at least one cover body is of polyoxymethylene (POM).
15. An optical element according to claim 12 wherein,
said at least one cover body is of polypropylene (PP).
16. A method for forming an optical element for reflecting and/or redirecting
light rays entering therein and again emerging therefrom, having the following
steps:
 - a) producing a transparent base body having reflection surfaces which
are formed such that at least a part of light rays incident on said reflection surfaces
will, upon emergence from the base body be totally reflected, and
 - b) covering over the outer sides of said reflection surfaces with at least
one cover body, such that the reflection surfaces and surfaces of the at least one
cover body which face toward said reflection surfaces are adapted to one another
and have between them there a thin gap or only point contacts,
said at least one cover body being of plastic and said at least one cover
body or said base body being applied to the other in the liquid state and
subsequently hardened.
17. A method according to claim 16 wherein,
the at least one cover body is applied by means of injection molding or
injection compressing.
18. A method according to claim 16 wherein,
said at least one cover bodies is cast onto said base body.

19. A method according to claim 16 wherein,
said transparent base body is a flexible foil having a substantially smooth light entry side and an opposite reflection side having microprisms,
wherein said foil is initially arranged with its smooth light entry side on a shaping body and is then applied to the reflection side of said at least one cover body.
20. A method according to claim 16 wherein,
said transparent base body is produced by means of injection molding.
21. A method according to claim 20 wherein,
during production of said transparent base body, a light emitting diode is enclosed in the transparent material of said transparent base body.
22. A method according to claim 20 wherein,
said at least one cover body is initially formed and thereafter said transparent base body is applied to said at least one cover body.